

(1) Los op vir  $x$ :

$$(a) \quad \frac{1}{2}(x+3) = \frac{1}{3}(x-1)$$
$$\frac{(x+3)}{2} = \frac{(x-1)}{3} \quad KGV = 6$$

$$\therefore 3(x+3) = 2(x-1)$$

$$3x+9 = 2x-2$$

$$3x-2x = -2-9$$

$$x = -11$$

$$(b) \quad -4 < \frac{-2(x+1)}{3} \leq 6 \quad KGV = 3$$

$$\therefore -4 \times 3 < -2(x+1) \leq 6 \times 3$$

$$-12 < -2x-2 \leq 18$$

$$-12+2 < -2x \leq 18+2$$

$$-10 < -2x \leq 20$$

$$\frac{-10}{-2} > \frac{-2x}{-2} \geq \frac{20}{-2}$$

$$5 > x \geq -10 \Rightarrow \therefore -10 \leq x < 5$$

$$(c) \quad \frac{3}{2x-1} - \frac{4}{3-x} = \frac{7}{2x^2-7x+3}$$

$$\frac{3}{(2x-1)} - \frac{4}{(3-x)} = \frac{7}{(2x-1)(x-3)}$$

$$\frac{3}{(2x-1)} \ominus \frac{4}{(x-3)} = \frac{7}{(2x-1)(x-3)}$$

$$\{ KGV = (2x-1)(x-3) \rightarrow x \neq \frac{1}{2} \text{ of } x \neq 3 \}$$

$$\therefore 3(x-3) \oplus 4(2x-1) = 7$$

$$3x-9+8x-4 = 7$$

$$11x-13 = 7$$

$$11x = 20$$

$$x = \frac{20}{11}$$

$$(d) \quad (x^{\frac{3}{4}} - 8)(9^{x-1} - 27) = 0$$

$$x^{\frac{3}{4}} - 8 = 0 \quad \text{of} \quad 9^{x-1} - 27 = 0$$

$$x^{\frac{3}{4}} = 8 \quad 9^{x-1} = 27$$

$$x^{\frac{3}{4}} = 2^3 \quad (3^2)^{x-1} = 3^3$$

$$\left(x^{\frac{3}{4}}\right)^{\frac{4}{3}} = \left(2^3\right)^{\frac{4}{3}} \quad 3^{2x-2} = 3^3$$

$$x = 2^4 \quad GG \Leftrightarrow GE$$

$$x = 16 \quad \therefore 2x - 2 = 3$$

$$2x = 5$$

$$x = \frac{5}{2}$$

$$(e) \quad (3x + 4)^2 = 25$$

$$\sqrt{(3x+4)^2} = \pm\sqrt{25}$$

$$3x+4 = \pm 5$$

$$\therefore 3x+4 = 5 \quad \text{of} \quad 3x+4 = -5$$

$$3x = 5 - 4 \quad 3x = -5 - 4$$

$$3x = 1 \quad 3x = -9$$

$$x = \frac{1}{3} \quad x = \frac{-9}{3}$$

$$x = -3$$

$$(f) \quad 2 - (x-2)(x+2) = 4 - x^2$$

$$2 - (x^2 - 4) = 4 - x^2$$

$$2 - x^2 + 4 = 4 - x^2$$

$$-x^2 + 6 = 4 - x^2$$

$$-x^2 + x^2 = 4 - 6$$

$$0 = -2 \quad ???$$

Geen  $\mathbb{R}$ -oplossing!

(g)  $(x - 5)^2(x + 2) \leq 0$

$(x - 5)^2 \geq 0 \quad \forall x \in \mathbb{R}$

$\therefore x + 2 \leq 0$

$\therefore x \leq -2$

(h)  $\frac{-3(2x - 1)(5 - x)(x + 0,5)^2}{-3} = \frac{0}{-3}$

$\therefore (2x - 1)(5 - x)(x + 0,5)^2 = 0$

$\therefore 2x - 1 = 0$  of  $5 - x = 0$  of  $\sqrt{(x + 0,5)^2} = \sqrt{0}$

$x = \frac{1}{2}$

$5 = x$

$\therefore x + 0,5 = 0$

$\therefore x = -0,5$

(i)  $x^{\frac{1}{2}} + 2x^{\frac{1}{4}} - 24 = 0$

$(x^{\frac{1}{4}} + 6)(x^{\frac{1}{4}} - 4) = 0$

$x^{\frac{1}{4}} + 6 = 0$

of

$x^{\frac{1}{4}} - 4 = 0$

$x^{\frac{1}{4}} = -6$

$x^{\frac{1}{4}} = 4$

↓

$(x^{\frac{1}{4}})^4 = (4)^4$

Geen  $\mathbb{R}$ -opl.

$x = 256$

(j)  $(x - p)^2 = (2x + q)^2$

$\sqrt{(x - p)^2} = \pm \sqrt{(2x + q)^2}$

$x - p = \pm (2x + q)$

$\therefore x - p = 2x + q$

of

$x - p = -(2x + q)$

$-p - q = 2x - x$

$x - p = -2x - q$

$-p - q = x$

$x + 2x = p - q$

$\therefore x = -p - q$

$3x = p - q$

$x = \frac{p - q}{3}$

(2) Los die volgende vergelykings gelyktydig op:

$$\text{KGV}=2: \quad \frac{x}{2} = 3 - \frac{x+y}{2} \quad \text{en} \quad \frac{3x-y}{4} - \frac{x+y}{2} = -1 \quad \text{KGV}=4$$

$$\therefore x = 3 \times 2 - (x+y) \quad \text{en} \quad 3x - y - 2(x+y) = -1 \times 4$$

$$x = 6 - x - y \quad 3x - y - 2x - 2y = -4$$

$$x + x = 6 - y \quad x - 3y = -4$$

$$2x = 6 - y \quad \text{--- (1)} \quad \therefore x = 3y - 4 \quad \text{--- (2)}$$

Vervang (2) in (1):

$$\therefore 2(3y - 4) = 6 - y$$

$$6y - 8 = 6 - y$$

$$6y + y = 6 + 8$$

$$7y = 14$$

$$y = \frac{14}{7}$$

$$y = 2$$

$$x = 3(2) - 4$$

$$= 6 - 4$$

$$x = 2$$

$$\therefore (2; 2)$$

(3) Maak  $i$  die onderwerp as  $A = K(1 + i)^n$ .

$$A = K(1 + i)^n$$

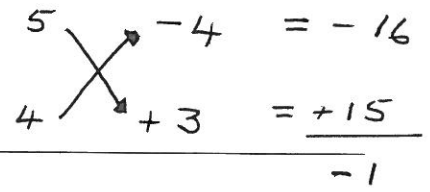
$$\frac{A}{K} = (1 + i)^n$$

$$\therefore (1 + i)^n = \frac{A}{K}$$

$$1 + i = \sqrt[n]{\frac{A}{K}}$$

$$i = \sqrt[n]{\frac{A}{K}} - 1$$

(4) Bepaal  $\frac{x}{y}$  as  $20x^2 - xy - 12y^2 = 0$



$$20x^2 - xy - 12y^2 = 0$$

$$(5x - 4y)(4x + 3y) = 0$$

$$\therefore 5x - 4y = 0 \quad \text{of} \quad 4x + 3y = 0$$

$$5x = 4y$$

$$\frac{x}{y} = \frac{4}{5}$$

$$4x = -3y$$

$$\frac{x}{y} = -\frac{3}{4}$$

(5) Bereken  $p$  en  $q$  as:  $(2p - 3)^2 + (q + 6)^2 = 0$

$$(\quad)^2 + (\quad)^2 = 0 \quad \text{net vir } (0)^2 + (0)^2$$

$$\therefore 2p - 3 = 0 \quad \text{en} \quad q + 6 = 0$$

$$2p = 3$$

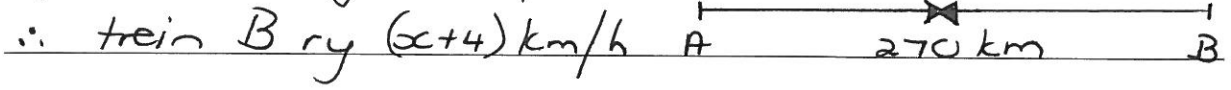
$$q = -6$$

$$p = \frac{3}{2}$$

(6) Twee treine vertrek 270 km van mekaar af.  
Na 3 ure ry hulle by mekaar verby.  
Bereken elke trein se spoed as die twee treine se spoed met 4 km/h verskil.

	$A = S \times T$	$V/S$	Gegee
	$A = S \times T$		
Trein A	$3x$	$x$	3
Trein B	$3(x+4)$	$x+4$	3

$V/S$  trein A ry  $x$  km/h



$$\therefore 3x + 3(x+4) = 270$$

$$3x + 3x + 12 = 270$$

$$6x = 270 - 12$$

$$6x = 258$$

$$x = 43$$

$\therefore$  Trein A ry 43 km/h en Trein B 47 km/h